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AUTHOR Kinnebrew, Elbert L.
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ABSTRACT

Since fall 1972, Sacramento City College has operated a pilot project designed to provide minority students with extra tutorial and laboratory assistance and, thereby, to encourage them to pursue careers in mathematics, science, technology, and the allied health fields. The primary focus of the program was placed on one-to-one tutorials intended to remedy the problems faced by minority students in their regular classes. To this end, a laboratory was established centrally in the science complex and was staffed by a project director and six qualified peer tutors. In order to evaluate the success of the pilot project, questionnaires were distributed to students who had participated in the program and to minority students who had enrolled in mathematics, science, technology, or allied health courses, but who had not participated in the program. The responses from Asian, black, Mexican-American, and Native American students are presented separately. As a result of this evaluation study, it is recommended that the pilot phase of this program be ended and that the program be continued on a regular basis. The questionnaires are appended, as are descriptions of the auto-tutorial aids currently utilized in the program laboratory. (DC)

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A PROJECT DESIGNED TO STRENGTHEN AND SUPPORT MINORITY STUDENTS MATRICULATING IN MATHEMATICS, SCIENCE, TECHNOLOGY, AND THE ALLIED HEALTH FIELDS AT SACRAMENTO CITY COLLEGE.

SACRAMENTO CITY COLLEGE
OFFICE OF RESEARCH AND DEVELOPMENT.

AN EVALUATION AND REVIEW
SACRAMENTO CITY COLLEGE
1975.

U S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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Any one who has common sense will remember that the bewilderments of the eyes are of two kinds, and arise from two causes, either from going into the light, which is true of the mind's eye, quite as much as of the bodily eye; and he who remembers this when he sees any one whose vision is perplexed and weak, will not be too ready to laugh; he will first ask whether that soul of man has come out of the brighter light, and is unable to see because unaccustomed to the dark, or having turned from darkness to the day is dazzled by excess of light. And he will count the one happy in his condition and state of being, and he will pity the other; or, if he have a mind to laugh at the soul which comes from below into the light, there will be more reason in this than in the laugh which greets him who turns from above out of the light into the den.

Plato, The Republic - Book Seven

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Mr. John Bucknell, Audio-Visual Officer, Sacramento City College, for his consistent support and material assistance.

Mr. Robert Lum, Project 30 Laboratory Director. His day to day work in this project has served as a cornerstone to this effort.

Mrs. Earnestine Barnes, Secretary and Research Assistant, Office of Research and Development. The contributions of Mrs. Barnes throughout both the research and functional stages of the project are far too numerous to be mentioned here.

Finally, to the outstanding services of the excellent tutorial staff discussed fully in this report, we owe a debt of gratitude. Rarely, if ever, has this researcher encountered such a magnificent group of young people dedicated to the cause of helping others.

To all of those not mentioned here, we gratefully acknowledge and appreciate the support given to this project to date.

A CLEAR, PRECISE, CRITICAL AND OBJECTIVE VIEW FROM OUTSIDE

As educational researchers and practitioners, all of us occasionally face a situation whereby we find ourselves too close to the problem to distinguish the proverbial "forest from the trees". We need then to call upon competent help from the outside to assure total objectivity in our interpretations.

Dr. Kent G. Stephens, Professor of Educational Administration, Brigham Young University, has provided this vital contribution to the research reported herein. Dr. Stephens has won international acclaim for the application of Fault Tree Analysis to educational problems, a process which he developed and refined over the past several years.

We were indeed fortunate to have had an educator of this rank to monitor this study.

PREFACE

At one time, there was an active discussion debating which was more important in the learning process--environment or heredity. For the disadvantaged student, the scale tipped toward environment. If the student has not gained certain concepts in the lower grades, he is likely to find he has little chance of playing "catch-up" within the conventional class.

At the same time, there is no "standard" program that the student who enters a community college has shared in concert with other of his fellow students. Each student, then, is truly unique in background and needs. Within the environment of the "regular" class with the "regular" approach to subject matter, an able, but ill-prepared student finds himself lost. Too often the result is a loss of self-confidence, a disillusionment with education, and a resentment against those to whom the student looked for help. He needed much and gained little.

Yet it is often because the student needs so much that he gains so little. The chemistry teacher points out that he must teach a certain amount of chemistry in a beginning class and can't do so if he has to stop to teach mathematics. And he considers competency in mathematics essential if the student is to succeed. His suggestion, therefore, would be that the student drop chemistry and take mathematics. And a given mathematics instructor might suggest that the student enroll for basic mathematics before attempting his particular course which is a prerequisite to chemistry.

The environment is then in control of the student.

In an effort to provide the student with some control over his educational development, alternative methods must be devised for the student who needs help within the traditional framework. Such a student has neither the experience nor the resources to proceed on his own in any external degree program but both wants and seeks the guidance and support that can be found within the conventional institution. In a two-year college, he is often in pursuit of technical training which requires a systematic series of supervised activities using equipment to which he cannot readily find access on his own.

This project presents alternatives designed to remove the student from dependency on the attitude, good will, or time constraints of any one other than himself. This has allowed him to function within the college framework that he desires with the help and support that he needs. This project has sought to define what a student should know at the end of a course and then provide that material in easily assimilated forms.

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THE PROBLEM

INTRODUCTION

In a national study recently completed by this researcher, 100 selected American community colleges were asked to define their efforts to solve the dilemma expressed in the preceding statement of the problem approached in this report.

These colleges selected to achieve excellent geographic balance, two from each of the fifty states, were sent a questionnaire designed to make the following determinations.

1. To determine the number and description of programs designed to eliminate obstacles facing minority students enrolled in courses in mathematics, science, technology, and the allied health fields in American community and junior colleges.
2. To determine the attitudes of selected community and junior college governing personnel toward efforts designed to eliminate obstacles facing minority students in their efforts to matriculate in mathematics, science, technology, and the allied health fields.
3. To determine the extent to which minority students are encouraged to enroll in courses leading to completion of majors or certificates in the areas of mathematics, science, technology, and the allied health fields.

Specifically, answers were sought to the followirg questions:

1. What programs exist in selected American community colleges specifically for the purpose of strengthening minority students in the areas of mathematics, science, technology, and the allied health fields?

2. What research projects have been conducted or are now being conducted designed to guide program development to strengthen minority students in the areas of science, mathematics, technology, and the allied health fields?
3. Which of the selected colleges are willing and desirous of sharing information on programs designed to strengthen minority students in the areas of mathematics, science, technology, and the allied health fields?

The results of this study has clearly pointed out several important facts. Among these are:

1. Boards of trustees have attached a low priority to the urgency of implementation of programs designed for the recruitment and retention of minority students, specifically, American Indian, Black, and Mexican-American, in programs relating to mathematics, science, technology, and the related allied health fields.
2. The evidence from the present study also points to this conclusion. Recruitment efforts designed to encourage minority students, specifically American Indian, Black, and Mexican-American, are minimal. Only twelve of the seventy-six colleges participating in the study indicated any organized effort designed to recruit students of these ethnic backgrounds for programs in mathematics, science, technology, and the allied health fields.
3. Although the findings indicate that 44 percent of the seventy-six participating colleges receive frequent requests from business and industry for minority graduates in the area addressed by this study, most of these institutions still, however, have not implemented vigorous programs designed to prepare students to meet

these requests. This evidence leads to the conclusion that even though the nation's businesses and industries continue to request participation and representation from all segments of the American population, community-junior college governing personnel are still reluctant to act to meet the challenge in the areas of minority participation in mathematics, science, technology, and the allied health fields.

At Sacramento City College, an effort to meet the challenge outlined earlier in this report has been in operation since the fall semester, 1971.

This effort, hereafter referred to as Project 30, it's successes and failures will be explored thoroughly in this report. It is hoped that these findings will be helpful in determining future directions of Project 30 on the Sacramento City College campus as well as lend encouragement and support to other institutions wishing to seek solutions to this problem.

THE BEGINNING

For several months during 1970-71, many discussions concerning the problem addressed in this report was conducted at the Science Department and the college administrative level. The decision to recruit a small group of minority students from the feeder high schools for a pilot project was finally reached.

In reaching a decision regarding the number of students that could be effectively handled, several suggestions were made. The number of students to be recruited was eventually set at thirty; thus, the introduction of the phrase Project 30. While this format has been altered many times, the Project 30 phrase has remained a permanent identification of this effort.

ORIGINAL PROJECT DESIGN

The initial project design called for the establishment of a laboratory located centrally in the science complex to be designated as the Project 30 laboratory and six tutors, all extremely capable in the areas of science and mathematics, and equally able to grasp an understanding of the human factors involved in working with the educationally disadvantaged student. A project director, graduate science student or holder of a M.S. degree was to be hired to direct the laboratory.

The primary focus was to be placed on a "one-to-one" tutorial level meeting and remedying each day's problems met by the student matriculating in regular science classes.

From the beginning, the laboratory was not conceived as a minority student laboratory, but rather as an open laboratory serving all students desiring help. It was however, to maintain an approach and atmosphere specifically designed

to help minority students feel comfortable with his or her attempt to successfully matriculate in courses of a scientific and technical nature.

As resources became available, auto-tutorial devices, electronic self-paced learning devices, etc., were to be added to augment the efforts of the tutors. Assistance from the Counseling Department was to come from an assigned counselor.

The project has held basically to the original design. Each of these areas of activity is discussed in detail in the remainder of this report. A description of the auto-tutorial equipment and programs may be found in the appendix.

SUPPORTING RESEARCH

Project 30, as stated earlier, has been conducted to this point as an action research project, and records, as revealed in the remaining sections of this report, have been meticulously kept and analyzed.

In addition to the local campus research design, the services of Dr. Kent G. Stephens, Professor of Education, Brigham Young University, were obtained to analyze the problems facing minority students on the Sacramento City College campus attempting to matriculate in courses relating to mathematics, science, technology, and the allied health fields. The following summary of this work provides additional support to this effort.

FAULT TREE ANALYSIS--A DETAILED SPECIFIC STUDY OF CAUSES OF FAILURE OF MINORITIES TO MATHEMATICS, TECHNOLOGY, ENGINEERING, AND THE ALLIED HEALTH FIELDS

During the 1973-74 academic year, a thorough analysis of the problem of minority science-mathematics students at Sacramento City College was conducted under the supervision and guidance of Dr. Kent G. Stephens, Professor of Education, Brigham Young University. A review of the findings is being reported due to the immediate impact upon the findings of this study.

The analysis begins with the premise statement of an undesired event (UE) of critical importance. It may be the failure of the entire system, expressed as the failure of a mission; or it may be a failure identified with some subsystem or component. In any event, it stands at the top of

the tree, and the analysis proceeds downward. Inputs to the UE become contributing failure events in a cause and effect relationship. The UE related to the Sacramento City College, Sacramento, California, stated as its base the failure of Black, Mexican-American, and Native American students to succeed in science and math related areas in proportion to the total population at Sacramento City College.

Stephens stated that the final steps in Fault Tree Analysis consists of making recommendations based upon the strategic path analysis. These may include reallocating resources, installing back-up systems, providing for monitoring of paths with high failure potential, redesigning subsystems, providing for improved communications at interforces, or taking any other connective action that seems advisable.

CRITICAL PATHS AT SACRAMENTO CITY COLLEGE

The Prime Strategic Path

The prime strategic path revealed problems relating directly to the student and his parents. Beginning with a lack of financial resources resulting in the student receiving a poor education and mastery of basic skills, this path led through a series of failure events relating to student apathy and lack of desire due to poor home environment.

Recommendations Based Upon the Strategic Path Analysis

Analysis of the critical paths suggested the following recommendations based upon the idea that institutional change could be brought about much faster than socio-economic remedies:

1. Recruitment of qualified minority technical staff members in order to furnish success symbols for minority students desiring to matriculate in technical areas of the curriculum.
2. Provision of remedial and developmental programs designed to rebuild poor backgrounds in math, science, technology, the technically related courses, as well as the related health fields.
3. Begin active recruitment efforts designed to inform minority students of Sacramento City College's desire to have them participate in science, math and technically related portions of the curriculum.

DATA ANALYSIS

GROUP A-EXPERIMENTAL

Students in this group were chosen from those actively involved in the Project 30 experiment. A minimum of twenty hours on the daily log record sheets qualified these students for inclusion in the experimental group.

GROUP B-CONTROL

Minority students not participating in the formalized Project 30 experiment provided the members of the control group for this evaluation. The selection was based upon the report of minority students enrolled in at least one basic course related to mathematics, science, technology, or the related health fields.

ASSESSMENT OF LABORATORY ACTIVITY
PROJECT 30

ASIAN STUDENTS

QUESTIONNAIRES SENT 29 RESPONSES 11 % OF RESPONSES 37.9%

AGE AND SEX

MALE	FEMALE	18-21	22-30	31-40	41+
5	6	8	2	0	1

INVOLVEMENT IN PROJECT 30

MORNINGS	AFTERNOONS	BOTH
1	5	5

SEMESTER ENROLLED

F'72	S'73	F'73	S'74	F'74
0	2	6	2	1

QUALITY OF TUTORIAL SERVICES

EXCELLENT	GOOD	FAIR	POOR	NO RESPONSE
3	5	1	1	1

RECEIVED HELP WITH PROBLEMS NOT RELATED TO SUBJECT AREAS: YES 4 NO 7

CONVENIENCE OF LABORATORY HOURS

YES	NO	NO RESPONSE
9	1	1

USED AUTO TUTORIAL EQUIPMENT

YES	NO	NO RESPONSE
1	10	0

AUTO TUTORIAL EQUIPMENT USED

AUTO TUTOR	SLIDES	FILMSTRIPS	CASSETTE TAPES
0	0	0	1

INDIVIDUAL PROGRAMMED LEARNING PACKAGES	OTHERS
1	0

AVAILABILITY OF TUTORS

EXCELLENT	GOOD	FAIR	POOR	NO RESPONSE
0	6	3	1	1

COURSES ENROLLED THAT CAUSED STUDENTS TO SEEK SERVICES OF PROJECT 30

BIOLOGY	MATHEMATICS	CHEMISTRY	PHYSICS
2	9	4	1

PROJECT 30 RECOMMENDED BY INSTRUCTOR: YES 4 NO 7

INSTRUCTOR AWARENESS OF STUDENT'S PARTICIPATION IN PROJECT 30:

YES	NO	NO RESPONSE
0	7	0

CURRENTLY ENROLLED IN INSTITUTION OF HIGHER EDUCATION: YES 4 NO 7

ASIAN STUDENTS (Cont.)

PROJECT EXPERIENCE HELPFUL

YES	NO	NO RESPONSE
1	1	2

CURRENTLY ENROLLED IN SIMILAR PROJECT AT INSTITUION OF HIGHER EDUCATION

YES	NO	NO RESPONSE
0	2	2

AGE-SEX DISTRIBUTION, NAME OF INSTITUTION CURRENTLY BEING ATTENDED AND RECOMMENDATION FOR CONTINUATION OR DISCONTINUING PROJECT 30.

NAME OF INSTITUTION	AGE	SEX
Sacramento City College	22-30	F
----	41+	M
Sacramento City College	18-21	M
Sacramento City College	18-21	F
----	18-21	M
Sacramento City College	18-21	F
University California Davis	18-21	F
----	18-21	M
Sacramento City College	22-30	F
University California Davis	18-21	M

RECOMMEND CONTINUATION OF PROJECT 30 AT SACRAMENTO CITY COLLEGE

YES	NO	NO RESPONSE
6	2	3

ASSESSMENT OF LABORATORY ACTIVITY
PROJECT 30

BLACK STUDENTS

QUESTIONNAIRES SENT 33 RESPONSES 12 % OF RESPONSES 36.3%

AGE AND SEX

MALE	FEMALE	18-21	22-30	31-40	41+
4	8	4	7	1	0

INVOLVEMENT IN PROJECT 30

MORNINGS	AFTERNOONS	BOTH
3	3	6

SEMESTER ENROLLED

F'72	S'73	F'73	S'74	F'74
3	1	6	0	2

QUALITY OF TUTORIAL SERVICES

EXCELLENT	GOOD	FAIR	POOR
6	4	2	0

RECEIVED HELP WITH PROBLEMS NOT RELATED TO SUBJECT AREAS: YES 5 NO 7

CONVENIENCE OF LABORATORY HOURS

YES	NO	NO RESPONSE
9	2	1

USED AUTO TUTORIAL EQUIPMENT

YES	NO	NO RESPONSE
5	6	1

AUTO TUTORIAL EQUIPMENT USED

AUTO TUTOR	SLIDES	FILMSTRIPS	CASSETTE TAPES
3	1	2	3

INDIVIDUAL PROGRAMMED LEARNING PACKAGES	OTHERS
3	1

AVAILABILITY OF TUTORS

EXCELLENT	GOOD	FAIR	POOR
3	5	2	2

COURSES ENROLLED THAT CAUSED STUDENTS TO SEEK SERVICES OF PROJECT 30

BIOLOGY	MATHEMATICS	CHEMISTRY	PHYSIOLOGY & ANATOMY
8	4	7	2

PROJECT 30 RECOMMENDED BY INSTRUCTOR: YES 6 NO 6

INSTRUCTOR AWARENESS OF STUDENT'S PARTICIPATION IN PROJECT 30

YES	NO	NO RESPONSE
2	3	1

BLACK STUDENTS (Cont.)

CURRENTLY ENROLLED IN INSTITUTION OF HIGHER EDUCATION

YES	NO	NO RESPONSE
8	4	0

PROJECT 30 EXPERIENCE HELPFUL

YES	NO	NO RESPONSE
5	3	0

CURRENTLY ENROLLED IN SIMILAR PROJECT AT INSTITUTION OF HIGHER EDUCATION

YES	NO	NO RESPONSE
1	7	0

AGE-SEX DISTRIBUTION, NAME OF INSTITUTION CURRENTLY BEING ATTENDED AND RECOMMENDATION FOR CONTINUATION OR DISCONTINUING PROJECT 30.

NAME OF INSTITUTION	AGE	SEX
Sacramento City College	22-30	F
San Jose State University	18-21	F
Cal State College Sonoma	22-30	M
California State University Sacramento	30-40	F
California State University Sacramento	18-21	F
California State University Sacramento	22-30	M
----	18-21	F
----	22-30	F
California State University Sacramento	22-30	M
California State University Sacramento	22-30	F
----	22-30	F
University California Davis	18-21	M

RECOMMEND CONTINUATION OF PROJECT 30 AT SACRAMENTO CITY COLLEGE

YES	NO	NO RESPONSE
12	0	0

ASSESSMENT OF LABORATORY ACTIVITY
PROJECT 30

MEXICAN-AMERICAN STUDENTS

QUESTIONNAIRES SENT 28 RESPONSES 7 % OF RESPONSES 25%

AGE AND SEX

MALE	FEMALE	18-21	22-30	31-40	41+
4	3	3	3	1	0

INVOLVEMENT IN PROJECT 30

MORNINGS	AFTERNOONS	BOTH
0	3	4

SEMESTER ENROLLED

F'72	S'73	F'73	S'74	F'74
0	2	2	1	2

QUALITY OF TUTORIAL SERVICE

EXCELLENT	GOOD	FAIR	POOR
2	5	0	0

RECEIVED HELP WITH PROBLEMS NOT RELATED TO SUBJECT AREAS: YES 4 NO 3

CONVENIENCE OF LABORATORY HOURS

YES	NO	NO RESPONSE
7	0	0

USED AUTO TUTORIAL EQUIPMENT

YES	NO	NO RESPONSE
2	5	0

AUTO TUTORIAL EQUIPMENT USED

AUTO TUTOR	SLIDES	FILMSTRIPS	CASSETTE TAPES
1	0	0	1

INDIVIDUAL PROGRAMMED LEARNING PACKAGES	OTHERS
0	0

AVAILABILITY OF TUTORS

EXCELLENT	GOOD	FAIR	POOR
3	3	1	0

COURSES ENROLLED THAT CAUSED STUDENTS TO SEEK SERVICES OF PROJECT 30

BIOLOGY	MATHEMATICS	CHEMISTRY	PHYSIOLOGY & ANATOMY
0	11	3	1

PROJECT 30 RECOMMENED BY INSTRUCTOR: YES 0 NO 7

INSTRUCTOR AWARENESS OF STUDENT'S PARTICIPATION IN PROJECT 30

YES	NO	NO RESPONSE
3	4	0

CURRENTLY ENROLLED IN INSTITUTION OF HIGHER EDUCATION: YES 3 NO 3
NO RESPONSE 1

MEXICAN-AMERICAN STUDENTS
(Cont.)

PROJECT 30 EXPERIENCE HELPFUL

YES	NO	NO RESPONSE
3	0	0

CURRENTLY ENROLLED IN SIMILAR PROJECT AT INSTITUTION OF HIGHER EDUCATION

YES	NO	NO RESPONSE
1	1	1

AGE-SEX DISTRIBUTION, NAME OF INSTITUTION CURRENTLY BEING ATTENDED AND RECOMMENDATION FOR CONTINUATION OR DISCONTINUING PROJECT 30.

NAME OF INSTITUTION	AGE	SEX
Sacramento City College	22-30	M
----	22-30	F
California State University Sacramento	31-40	F
----	18-21	M
Sacramento City College	18-21	M
University of California at Davis	22-30	M

RECOMMEND CONTINUATION OF PROJECT 30 AT SACRAMENTO CITY COLLEGE

YES	NO	NO RESPONSE
6	0	1

ASSESSMENT OF LABORATORY ACTIVITY
PROJECT 30

NATIVE AMERICAN STUDENTS

QUESTIONNAIRES SENT 6 RESPONSES 1 % OF RESPONSES 16.7%

AGE AND SEX

MALE	FEMALE	18-21	22-30	31-40	41+
0	1	0	1	0	0

INVOLVEMENT IN PROJECT 30

MORNINGS	AFTERNOONS	BOTH
0	0	1

SEMESTER ENROLLED

F'72	S'73	F'73	S'74	F'74
0	0	1	0	0

QUALITY OF TUTORIAL SERVICES

EXCELLENT	GOOD	FAIR	POOR
1	0	0	0

RECEIVED HELP WITH PROBLEMS NOT RELATED TO SUBJECT AREAS: YES 0 NO 1

CONVENIENCE OF LABORATORY HOURS

YES	NO	NO RESPONSE
0	0	1

USED AUTO TUTORIAL EQUIPMENT

YES	NO	NO RESPONSE
0	1	0

AUTO TUTORIAL EQUIPMENT USED

AUTO TUTOR	SLIDES	FILMSTRIPS	CASSETTE TAPES
0	0	0	0

INDIVIDUAL PROGRAMMED LEARNING PACKAGES	OTHERS
0	0

AVAILABILITY OF TUTORS

EXCELLENT	GOOD	FAIR	POOR
1	0	0	0

COURSES ENROLLED THAT CAUSED STUDENTS TO SEEK SERVICES OF PROJECT 30

BIOLOGY	MATHEMATICS	CHEMISTRY	PHYSIOLOGY & ANATOMY
0	0	0	1

PROJECT 30 RECOMMENDED BY INSTRUCTOR: YES 1 NO 0

INSTRUCTOR AWARENESS OF STUDENT'S PARTICIPATION IN PROJECT 30: YES 1 NO 0

CURRENTLY ENROLLED IN INSTITUTION OF HIGHER EDUCATION: YES 0 NO 1

PROJECT 30 EXPERIENCE HELPFUL: YES 1 NO 0

RECOMMEND CONTINUATION OF PROJECT 30 AT SACRAMENTO CITY COLLEGE: YES 1 NO 0

ASSESSMENT OF LABORATORY ACTIVITY
PROJECT 30

OTHER STUDENTS

QUESTIONNAIRES SENT 8 RESPONSES 2 % OF RESPONSES 25%

AGE AND SEX

MALE	FEMALE	18-21	22-30	31-40	41+
1	1	0	2	0	0

INVOLVEMENT IN PROJECT 30

MORNINGS	AFTERNOONS	BOTH
0	0	2

SEMESTER ENROLLED

F'72	S'73	F'73	S'74	F'74
0	0	1	1	0

QUALITY OF TUTORIAL SERVICES

EXCELLENT	GOOD	FAIR	POOR
1	1	0	0

RECEIVED HELP WITH PROBLEMS NOT RELATED TO SUBJECT AREAS: YES 1 NO 1

CONVENIENCE OF LABORATORY HOURS

YES	NO	NO RESPONSE
2	0	0

USED AUTO TUTORIAL EQUIPMENT

YES	NO	NO RESPONSE
2	0	0

AUTO TUTORIAL EQUIPMENT USED

AUTO TUTOR	SLIDES	FILMSTRIPS	CASSETTE TAPES
1	1	0	1

INDIVIDUAL PROGRAMMED LEARNING PACKAGES	OTHERS
0	0

AVAILABILITY OF TUTORS

EXCELLENT	GOOD	FAIR	POOR
1	0	1	0

COURSES ENROLLED THAT CAUSED STUDENTS TO SEEK SERVICES OF PROJECT 30

BIOLOGY	MATHEMATICS	CHEMISTRY	PHYSIOLOGY & ANATOMY
1	2	2	0

PROJECT 30 RECOMMENDED BY INSTRUCTOR: YES 2 NO 0

INSTRUCTOR AWARENESS OF STUDENT'S PARTICIPATION IN PROJECT 30: YES 0 NO 0

CURRENTLY ENROLLED IN INSTITUTION OF HIGHER EDUCATION: YES 0 NO 2

PROJECT 30 EXPERIENCE HELPFUL: YES 0 NO 0 NO RESPONSE 2

RECOMMEND CONTINUATION OF PROJECT 30 AT SACRAMENTO CITY COLLEGE: YES 2 NO 0

ASSESSMENT OF LABORATORY ACTIVITY
NON-PROJECT 30 STUDENTS

BLACKS

QUESTIONNAIRES SENT 136 RESPONSES 30 % OF RESPONSES 22%

AGE AND SEX

MALE	FEMALE	18-21	22-30	31-40	41+
13	17	15	10	2	3

SEMESTER ENROLLED

F'72	S'73	F'73	S'74
9	5	9	7

CURRENTLY ENROLLED IN COURSES LEADING TO A DEGREE IN SCIENCE, MATHEMATICS, OR TECHNOLOGY: YES 11 NO 18 NO RESPONSE 1

INSTITUTION CURRENTLY ATTENDING

SACRAMENTO CITY COLLEGE	CALIFORNIA STATE UNIVERSITY SACRAMENTO
10	9

AMERICAN RIVER COLLEGE	SAN FRANCISCO STATE UNIVERSITY	CAL POLY
1	1	1

UNIVERSITY OF CALIFORNIA SANTA BARBARA	NOT ATTENDING	NO RESPONSE
1	2	3

SPECIAL HELP WITH COURSES IN SCIENCE, MATHEMATICS OR TECHNOLOGY

YES	NO	NO RESPONSE
13	17	0

SOURCE OF SPECIAL HELP

MATH LAB	TUTOR	INSTRUCTOR	PROJECT 30	TUTORIAL CENTER	OTHER
3	1	1	5	2	1

WAS SPECIAL HELP ADEQUATE: YES 11 NO 1 NO RESPONSE 1

AWARE OF EXISTENCE OF PROJECT 30: YES 12 NO 17 NO RESPONSE 1

PURSUING A CAREER IN AREA RELATED TO SCIENCE, MATHEMATICS, OR TECHNOLOGY

YES	NO	NO RESPONSE
19	8	3

SPECIFIC CAREER	AGE	SEX	INSTITUTION ATTENDING
Journalism	22-30	F	Sacramento City College
Criminal Justice	22-30	F	California State University Sacramento
Administration of Justice	18-21	M	Sacramento City College
Broadcasting	18-21	M	California State University San Francisco
Clinical Lab Technology	22-30	M	California State University Sacramento

BLACKS (Cont.)

SPECIFIC CAREER	AGE	SEX	INSTITUTION ATTENDING
Early Childhood Education	18-21	F	Sacramento City College
Teaching	18-21	F	California State University Sacramento
Physical Therapy	22-30	M	Sacramento City College
Mechanical Electrical Technology	18-21	M	Sacramento City College
Social Work	18-21	F	California State University Sacramento
X-Ray Technician	18-21	M	Sacramento City College
Business Administration	22-30	M	Sacramento City College
Funeral Director/Embalmer	22-30	M	-----
Nursing	18-21	F	-----
Social Services	41+	F	-----
----	40	F	Correspondence School
Business Administration	18-21	F	Sacramento City College
Health Science Community Health	22-30	F	Sacramento City College
Painter	18-21	M	-----
Business	18-21	F	-----
Criminal Justice	18-21	F	California State University Sacramento
Human Services	30-40	M	American River College
R.N. Nursing	41+	F	-----
Business Administration	41+	F	California State University Sacramento
Electrical Technology	22-30	M	Sacramento City College
Social Work	18-21	F	California State University Sacramento
Computer Science	18-21	F	Cal Poly
----	22-30	M	Sacramento City College
Journalism	22-30	F	California State University Sacramento
Lawyer	18-21	M	University California Santa Barbara

ENCOURAGEMENT RECEIVED FROM INSTRUCTORS/COUNSELORS RELATIVE TO PURSUING COURSE WORK IN SCIENCE, MATHEMATICS, AND TECHNOLOGY

YES	NO	NO RESPONSE
19	11	0

ASSESSMENT OF LABORATORY ACTIVITY
NON-PROJECT 30 STUDENTS

MEXICAN-AMERICANS

QUESTIONNAIRES SENT 186 RESPONSES 31 % OF RESPONSES 16.7%

AGE AND SEX

MALE	FEMALE	18-21	22-30	31-40	41+
18	13	10	19	0	2

SEMESTER ENROLLED

F'72	S'73	F'73	S'74
10	7	5	9

CURRENTLY ENROLLED IN COURSES LEADING TO A DEGREE IN SCIENCE, MATHEMATICS, OR TECHNOLOGY: YES 11 NO 20

INSTITUTION CURRENTLY ATTENDING

SACRAMENTO CITY COLLEGE	CALIFORNIA STATE UNIVERSITY SACRAMENTO
12	7
SAN FRANCISCO STATE UNIVERSITY	UNIVERSITY OF CALIFORNIA DAVIS
1	2
NOT ATTENDING	NO RESPONSE
5	4

SPECIAL HELP WITH COURSES IN SCIENCE, MATHEMATICS OR TECHNOLOGY

YES	NO	NO RESPONSE
11	20	0

SOURCE OF SPECIAL HELP

MATH LAB	TUTOR	INSTRUCTOR	PROJECT 30
2	1	3	1
TUTORIAL CENTER	OTHER	NO RESPONSE	
2	1	1	

WAS SPECIAL HELP ADEQUATE: YES 7 NO 2 NO RESPONSE 2

AWARE OF EXISTENCE OF PROJECT 30: YES 10 NO 21 NO RESPONSE 0

PURSUING A CAREER IN AREA RELATED TO SCIENCE, MATHEMATICS, OR TECHNOLOGY

YES	NO	NO RESPONSE
11	19	1

MEXICAN-AMERICANS (Cont.)

SPECIFIC CAREER	AGE	SEX	INSTITUTION ATTENDING
Dentist	18-21	M	Sacramento City College
Electrical Engineering	22-30	M	California State University Sacramento
Xerographic Technician	22-30	M	----
Early Childhood Development	22-30	F	Sacramento City College
Accounting	22-30	F	Sacramento City College
Electronic Technology	22-30	M	Sacramento City College
Social Work/Probation Officer	22-30	M	California State University Sacramento
Early Childhood Education	22-30	M	----
Biiingual Education	18-21	F	Sacramento City College
----	18-21	F	Sacramento City College
Social Worker	22-30	M	----
Professional Counseling	22-30	M	California State University Sacramento
Business Administration	22-30	F	California State University Sacramento
English	18-21	F	----
----	18-21	F	----
Accounting	22-30	M	----
Technical Representative	22-30	M	----
Aeronautics	41+	M	Sacramento City College
----	22-30	F	----
Pediatrician	22-30	F	University California Davis
English Literature	22-30	M	University California Davis
Data Processing	22-30	M	----
Business Administration	22-30	M	California State University Sacramento
----	22-30	M	----
Administration of Justice	18-21	F	Sacramento City College
Registered Nurse	22-30	F	Sacramento City College
----	18-21	F	Sacramento City College
Law Enforcement	18-21	M	California State University Sacramento
Business Administration	41+	M	California State University Sacramento
Plant Engineering	18-21	M	Sacramento City College
Theatre Arts	18-21	F	California State University San Francisco

ENCOURAGEMENT RECEIVED FROM INSTRUCTORS/COUNSELORS RELATIVE TO PURSUING COURSE WORK IN SCIENCE, MATHEMATICS, AND TECHNOLOGY

YES	NO	NO RESPONSE
15	15	1

ASSESSMENT OF LABORATORY ACTIVITY
NON-PROJECT 30 STUDENTS

NATIVE AMERICANS

QUESTIONNAIRES SENT 67 RESPONSES 13 % OF RESPONSES 19.4%

AGE AND SEX

MALE	FEMALE	18-21	22-30	31-40	41+
4	9	8	5	0	0

SEMESTER ENROLLED

F'72	S'73	F'73	S'74
1	1	8	3

CURRENTLY ENROLLED IN COURSES LEADING TO A DEGREE IN SCIENCE, MATHEMATICS, OR TECHNOLOGY: YES 4 NO 9

INSTITUTION CURRENTLY ATTENDING

SACRAMENTO CITY COLLEGE	CALIFORNIA STATE UNIVERSITY SACRAMENTO
6	3

AMERICAN RIVER COLLEGE	LANEY COLLEGE	NOT ATTENDING
1	1	2

SPECIAL HELP WITH COURSES IN SCIENCE, MATHEMATICS OR TECHNOLOGY

YES	NO	NO RESPONSE
5	8	0

SOURCE OF SPECIAL HELP

MATH LAB	INSTRUCTOR	PROJECT 30
1	2	2

WAS SPECIAL HELP ADEQUATE: YES 5 NO 0 NO RESPONSE 0

AWARE OF EXISTENCE OF PROJECT 30: YES 4 NO 9 NO RESPONSE 0

PURSUING A CAREER IN AREA RELATED TO SCIENCE, MATHEMATICS, OR TECHNOLOGY

YES	NO	NO RESPONSE
5	6	2

SPECIFIC CAREER	AGE	SEX	INSTITUTION ATTENDING
------	22-30	M	Sacramento City College
Nursing	22-30	F	Sacramento City College
Art	18-21	F	California State University Sacramento
Teaching	22-30	M	California State University Sacramento

NATIVE AMERICANS (Cont.)

SPECIFIC CAREER	AGE	SEX	INSTITUTION ATTENDING
Social Service Technician	18-21	F	----
----	18-21	F	Sacramento City College
Psychologist	18-21	F	California State University Sacramento
Business/Economics	18-21	M	Sacramento City College
Literature	18-21	F	Laney College
Forestry	18-21	M	Sacramento City College
Dental Assisting	18-21	F	Sacramento City College
Forestry	22-30	F	American River College
RN Nursing	22-30	F	----

ENCOURAGEMENT RECEIVED FROM INSTRUCTORS/COUNSELORS RELATIVE TO PURSUING COURSE WORK IN SCIENCE, MATHEMATICS, AND TECHNOLOGY

YES	NO	NO RESPONSE
5	7	1

INTERPRETIVE STATEMENT REGARDING DATA

As stated earlier, the primary objective of Project 30 was to increase the number of minority students matriculating in the science, mathematics, and technical curricula at Sacramento City College. As verified in the position statement by Mr. Ira David, Chairperson, Science and Mathematics Division, (see appendix), and the data presented, this has certainly been achieved.

This singular accomplishment would more than verify the existence of Project 30. Careful review of the data and a study of the actual comments by students in both groups being reported attest further to the need for this effort.

While it is much too soon to assess the project in terms of these students completing programs in mathematics, science, and technology in four year colleges and universities, the number currently enrolled in these institutions is impressive. Continued efforts will be made to follow the progress of Project 30 students in the years ahead.

PROJECT 30 - SUMMARY - Division Level

February 28, 1975

In the fall of 1972 "Project 30" was put into operation. Previous to this the Physics Department had become concerned that the minority students were avoiding the science areas. It was felt some action was needed to encourage the minority students to take part in our program. We hoped to help the potentially qualified student to achieve success in an area where his or her background was minimal.

The operation began on a one to one tutor basis with scheduled times for assistance. This continues to be the format at the present time with the addition of some hardware and additional materials which expand the tutorial nature of the program.

After three years of operation we have noted an increase in the numbers of minorities who have completed programs in the Science and Mathematics Areas.

We feel that the Math-Science Tutorial Laboratory (Project 30) has shown that students with disadvantaged educational backgrounds, especially in our areas, can profitably benefit from our type program. The program, undoubtedly, depends upon the tutors dedication, a laboratory instructional assistant to provide the organizational method. And inspiration, a certificated teacher willing to spend much time and effort, and a Research and Development Dean that knows the concept is valid. Here at Sacramento City College we were fortunate to have all of the ingredients for a successful program. We are proud of our increased minority student participation and success in our Science and Mathematics Curriculum.

Ira A. David, Division Chairperson

SCIENCE AND MATHEMATICS

I D:FH

RECOMMENDATIONS

While this study generally supports the excellence of this project, several areas are in need of strengthening.

The area of counseling services needs to be examined and structured, and a stationary funding pattern must be established if the project is to be continued successfully. It is therefore recommended that the action research phase of this project be ended and that it be placed permanently under the area of instructional administration and be continued as a regular program for students.

Respectfully submitted,

Elbert L. Kinnebrew
Assistant Dean
Research and Development

PROJECT 30 PERSONNEL

Throughout the operation of the Project 30 laboratory, an effort has been made to employ the best qualified lab director and peer tutors available.

The following displays the qualifications of the director and tutors that served consistently for at least one semester.

BACKGROUND AND CREDENTIALS
PROJECT DIRECTOR
MR. ROBERT LUM

A.A. degree in Biological Sciences from Sacramento City College, Sacramento, California

B.A. degree in Biological Sciences from California State University Sacramento, California

Currently enrolled in Master Program in Life Sciences at California State University - Sacramento, California

Seven years experience as a tutor and student teacher in mathematics, and science on both the secondary and junior college level.

PROJECT 30 TUTORS
QUALIFICATIONS

Please see following pages for tutor analysis.

PROJECT 30 TUTORS

TUTORS	GRADE POINT AVERAGE	SCIENCE-MATH CLASSES COMPLETED	SCIENCE-MATH CLASSES CURRENTLY ENROLLED	NUMBER OF HOURS TUTORED WEEKLY
I	3.60	Physiology & Anatomy, Biology 10A,10B, Chemistry, Algebra & Trigonometry	Microbiology	12 hours
II	2.62	Chemistry 1A, 1B, Biology 1A, 1B, Math 16A, 16B	Math 9A	13.5 hours
III	3.60	Biology 1A, 2, 3, Chemistry 1A, Math 9A, 9B	Physics 5A, Chemistry 1A	5 hours
IV	3.40	Algebra, Trigonometry, Pre-Calculus, Calculus 1 &2 Elementary Physics	----------	7 hours
V	3.78	Biology 1A,1B, Chemistry 1A, Physics 5A, Math 29, 16B	Chemistry 8, Physics 5B, Statistics 1	5 hours
VI	3.80	Chemistry 1A, 1B, Math 9A,9B, 9C,Physics 4A	Math 35, Physics 4C	12 hours
VII	3.82	Biology 1A, 1B, Chemistry 1A, 1B, Physics 5A, Math 29, 16A, 16B	Chemistry 8, Physics 5B, Statistics 1	5 hours
VIII	3.0	Chemistry 1A, Nursing 55,66,65, Biology 8, 1A, Microbiology	----------	7.5 hours
IX	3.17	Biology 1A, 1B, Math 29, 16A, 9A, 9B, Chemistry 1A,1B, 12A, 12B	----------	7 hours
X	3.85	Physiology and Anatomy, Microbiology, Chemistry 2A, General Biology	Nursing 65, 66	4 hours

PROJECT 30 TUTORS (Cont.)

TUTORS	GRADE POINT AVERAGE	SCIENCE-MATH CLASSES COMPLETED	SCIENCE-MATH CLASSES CURRENTLY ENROLLED	NUMBER OF HOURS TUTORED WEEKLY
XI	3.86	Math 29, 16A, Physics 5A, 5B, Chemistry 1A	Biology 1A, Math16B, Statistics 1	9 hours
XII	3.47	Biology 10, Chemistry 2A, 2B, Physiology & Anatomy	Physics 5A	6 hours
XIII	3.35	Algebra, Intermediate Algebra, Geometry, Trigonometry, Chemistry 1A	Calculus 16A, Chemistry 1A, Physics 5A	4 hours
XIV	3.80	Biology 1A, Chemistry 1A, 1B	Dental Hygiene Clinic	6 hours
XV	3.54	Math 29	Math 9A, Biology 10	8 hours
XVI	3.59	Math 9A, 9B, 9C, Physics 4A, 4C, Engineering 35	Math 11, Chemistry 1A, Physics 4B, Engineering 17	3 hours
XVII	3.44	Chemistry 1A, Biology 1A, Physiology & Anatomy, Microbiology	Histology, Pharmacology, Periodontology	6 hours
XVIII	3.37	Chemistry 1A, Chemistry 1B, Math 9A, 9B, Physics 4A	Math 9C, Physics 4B	7 hours

PROJECT 30 MEMBERS
GENERAL COMMENTS

1. Project 30 is a heck of a lot better than the tutorial center at S.C.C. I will recommend it to anyone.

2. Project 30 was extremely helpful to me and I'm thankful for it. I think you should continue with it. When I was going to Project 30, many students didn't even know that it existed.

3. I feel that Project 30's services are urgently needed. Their staff is friendly, knowledgeable, and understanding to student's needs.

4. Project 30 should be advertised more on campus. Also, there should be a closer relationship between instructors and Project 30.

5. Found Project 30 very helpful to my studies in science area. Also found assistance when I needed it without always having to make a specific appointment.

6. Instructors should put more emphasis on Project 30 instead of the math lab. The math lab, I feel, isn't as good as Project 30.

7. Project 30 is a very good program for students who never had an awareness of science previously.

8. I know Project 30 is effective for me and other students at S.C.C.

9. At the time I was involved in the program it was basically for minorities. But since then, there has been an increase in all students seeking help. Please continue the project, but hire more tutors so all can get the personal attention that I received.

10. Project 30 should be continued. I may need it again.

11. Project 30 is a very helpful tutorial program for students in the math and science fields. I strongly hope that this program will continue at S.C.C. now and in the future.

12. Project 30 was well used when I did have a chance to attend school. It sure made things a lot easier to have someone there to tutor on a one-to-one basis or see tapes and films on things I didn't understand. Thank you and please try to keep it.

PROJECT 30 MEMBERS
SUGGESTIONS FOR IMPROVEMENT

TUTORS

1. Project 30 was very helpful to me in my math class and I felt that most of the tutors there were quite helpful, but some would get down on me if I couldn't understand the concepts. I would always find someone there when I did have problems, and I feel that Project 30 was very helpful to me.

2. Unfortunately for me, the tutor assigned to me was transferred to a different program. When that happened, I was not assigned another tutor. Interesting to note was the fact that the director knew about this situation and did nothing to help my dilemma. Please don't misunderstand me, I think that Project 30 should stay in operation. It would be of great value to the students of S.C.C. and to the school itself.

3. A little more organization when it comes to the availability of tutors would be helpful.

4. I think Project 30 could use a few more tutors. I did learn my subject matter that I attended for, but I feel I should have been drilled more on my studies.

5. I became discouraged because each time I would seek assistance, there were not enough tutors, or the tutors were not available. I believe the project could be a great success if properly managed with sufficient manpower.

6. At the time I was involved in Project 30, there were all Asian tutors who seemed to cater only to Asians. I eventually went to the Tutorial Center in the library and received excellent help. I know not many Blacks or Chicanos take science courses, however, if you could get one or two Black or Chicano tutors, I believe it would help.

NON-PROJECT 30 MEMBERS

GENERAL COMMENTS

1. First, I'm glad minority students have this extra help available to them, but I do not think it should be limited to just minorities. Everyone who needs help in such areas should be able to use this service.

2. Many students are not aware of any extra help being offered. Perhaps you could advertise Project 30 in the school paper or put up posters around the campus instead of relying on the instructors to tell the students.

3. Any opportunities offered should be for any student with no regard to his minority status. After all, aren't we trying to overcome discrimination?

4. I think each science teacher should be made aware of Project 30 and what it has to offer. They should relate this information to the student at the beginning of each semester. Also, have advertising in the Express.

5. Let more people be aware of Project 30. Have all teachers advise students of such tutorial services.

6. Inform all minority students about Project 30.

7. Minority students should be informed that they can be helped in areas such as science, math, and technology.

8. Outside of informing the students still in high school, I feel you should flood the surrounding community to keep them abreast with such innovative programs. Use local ethnic radio, T.V., programs as well as newspapers.

9. Project 30 is a fine service for the students at S.C.C. and should be continued in full force.

10. Let more students be made aware of the existence of Project 30.

11. You should publicize programs like Project 30 more to the minority students during registration and through counselors.

NON-PROJECT 30 MEMBERS
SUGGESTIONS FOR IMPROVEMENTS

SUBJECT MATTER

1. The science courses are excellent; however, the area of pure math needs improvement. The impression I received from such classes (e.g., algebra, trigonometry, etc.) is a "sink or swim" situation. Classes fail to encourage interest in math-related fields and class rigidity is excessive. Math seems to be a stumbling block. Basic understanding of the concepts and practical applications to science should be stressed. Instead, rote memorization and boredom resulted.

2. Everyone needs basic math knowledge. Have prerequisite introductory courses if testing indicates areas of deficiency.

3. It would help to be better informed on different classes leading up to a career in science or math.

4. There should be an adequate career center equipped with audio-visual self-study films and tapes for careers. Also a category of resource persons in each career should be kept so a student can talk with them and see the job site situation.

5. Minorities should be recruited for these fields of study.

6. For those minorities whose background in the scientific and mathematical fields are weak, perhaps the best incentive would be to devise a system in which those who are deficient can waive other required courses in order to concentrate on their weak areas. By offering a variety of these background courses, the general level of competency in these weak areas should be raised considerably.

7. We need more information on the type of training we want. I always get the run around. No one seems to know anything!

8. There should be recruitment or help in high school in science, math, and technology. When I was in high school, I wished that there was someone to help me in math and science.

9. A student failing an exam should be allowed to review such an exam to enable that student to learn what was failed. I thought this was a student's right. Currently I have this privilege available to me in the technology department and it helps!

10. Improve the opportunities for minority students desiring to pursue careers in science, math, and technology. We need publicity of the usefulness of the careers in science, math, and technology.

AUTO TUTORIAL AIDS

To assist and expand the individual tutor's capabilities, several excellent electronic self-pacing devices are currently in use in the Project 30 laboratory.

Two of these devices have proved to be extremely effective in this effort. These devices and the self paced instructional programs used with each are discussed in the following paragraph.

THE AUTO-TUTOR
A Branched Learning Technique

Designed and manufactured by Sargent Welch Scientific Company, this device enables the learner to move at his own pace through a complete basic program in any area of science.

After reading the material on each frame, multiple choice questions, designed to determine the student's comprehension of what has been read, are presented.

Wrong answers are noted on the screen with directions to the student to re-read the section and choose other answers. Upon the selection of the proper choice, the device advises the student to continue through the next sequence in the same manner.

This device has proven to be extremely popular as a basic method of rebuilding basic concepts missed partially or completely in science courses attempted in secondary schools. With this complete picture established, the tutor is then able to interpret the more advanced concepts being

THE AUTO-TUTOR (Cont.)

encountered by the student in the course in progress.

Programs availabe for use in the Auto-Tutor are listed below. Six of these machines are currently in use in the Project 30 laboratory.

AUTO-TUTOR PROGRAMS AVAILABLE

1. Career Arithmetic Series: Fractions
2. Career Arithmetic: Whole Numbers-Complex Operations
3. Career Arithmetic: Whole Numbers: Addition & Subtraction
4. Whole Numbers - Vol. 2 & 3
5. Career Arithmetic: Decimals-A Review Course
6. Career Arithmetic: Percentages
7. Ratio and Proportion

ADVANCED MATHEMATICS

8. Algebra - Trigonometry
9. Introduction to Algebra
10. Algebra - Semester 2 - Volumes, 1, 2, and 3
11. Trigonometry - Part I and II

CHEMISTRY

12. Scientific Measurement Systems: English to Metric
13. Scientific Notation
14. Basic Chemistry, Volumes 1 and 2

ELECTRONICS

15. Basic Electricity, Volumes 1 and 2

GENERAL BIOLOGY

16. Chemical Basis of Biology
17. The Cell
18. Nutrition and Metabolism

AUTO-TUTOR PROGRAMS AVAILABLE (Cont.)

PHYSIOLOGY AND ANATOMY

19. The Cardiovascular System
20. The Digestive System
21. The Lymphatic System
22. The Muscular System
23. The Nervous System
24. The Respiratory System
25. The Skeletal System
26. Reproduction in Humans
27. The Reproductive System
28. The Skin
29. The Urinary System

THE SINGER CARAMATE

Produced by the Singer Company, the Caramate, a compact and portable unit which combines the features of the Kodak slide carousel slide projection unit and the cassette tape playback unit, allows the complete program to be displayed on the front surface of the unit instead of an external screen.

Science instructors are thereby able to record individual tape-lectures, field trip recordings, etc., for immediate use of students participating in the Project 30 laboratory.

Software packages prepared professionally may be used by students desiring visual descriptions of techniques, as well as, verbal accounts. This technique has proved to be useful especially in the nursing programs, e.g., "How to Properly Prepare Hospital Beds".

THE SINGER CARAMATE (Cont.)

Lectures and slide presentations designed around geological expeditions etc., offer a typical example of the Caramate.

The following programs are available through this medium.

THE SINGER CARAMATE PROGRAMS
CHEMISTRY PROGRAMS

1. Volume and Mass
2. Conversion: English to Metric
3. Weights and Mole Concepts
4. Formuls and Composition Calculations
5. Electron Configurations and Orbital Diagrams
6. Atomic Structure and the Periodic Table - An Introduction
7. Electrical Forces Within Atoms
8. Bonding Between Atoms of the Same Element: Metals and the Metallic Bond
9. Boyle's Law, Charles Law, and Guy-Lussacs Law
10. Preparing Percent, Molar, and Normal Solutions

SACRAMENTO CITY COLLEGE
FOLLOW-UP QUESTIONNAIRE
PROJECT 30 - SCIENCE, MATHEMATICS, TECHNOLOGY

NAME_____ MALE___ FEMALE___

AGE: 18-21_____ 22-30____ 41+____

I INVOLVEMENT IN PROJECT 30 WHILE ATTENDING SCC:

Indicate the times that you spent in the Project 30 laboratory:
Mornings_____ Afternoons_____ Both_____

How do you rate the quality of tutorial services received?
Excellent_____ Good_____ Fair_____ Poor_____

Did you receive help with problems other than those related to the subject area? Yes____ No____

Were the operational hours of the laboratory convenient for you? Yes__ No__

Please rate the availability of tutors:
Excellent_____ Good_____ Fair_____ Poor_____

Did you use any of the auto-tutorial equipment while participating in Project 30? Yes____ No____

If you used the auto-tutorial equipment, please indicate which of the following were most helpful:

A. Auto-tutors_____
B. Slides _____
C. Filmstrips _____
D. Cassette tapes_____
E. Individual programmed learning packages _____
F. Others _____

What course(s) were you enrolled in that caused you to seek the services of the Project 30 laboratory?_____
_____
_____

Did your instructor recommend the Project to you? Yes____ No____

If the instructor did not recommend the Project, was he/she aware of your participation? Yes____ No____

II ACTIVITIES SINCE LEAVING PROJECT 30:

Are you currently enrolled in an institution of higher education? Yes__ No__

Name of institution currently attending:_____
_____

Did your experience in Project 30 prove helpful to you after transferring from Sacramento City College? Yes____ No____

Are you involved in a similar project in the institution you're presently attending? Yes____ No____

Do you recommend continuation of Project 30 at Sacramento City College? Yes____ No____

III PLEASE MAKE ANY ADDITIONAL COMMENTS, SUGGESTIONS, ETC., THAT MIGHT HELP US IN THE EVALUATION OF PROJECT 30. (Use back of sheet) Thank you!

NON-PROJECT 30 STUDENTS QUESTIONNAIRE

SACRAMENTO CITY COLLEGE
FOLLOW-UP QUESTIONNAIRE

PROJECT 30 - SCIENCE, MATHEMATICS, TECHNOLOGY

NAME_____ MALE____ FEMALE____

AGE: 18-21_____ 22-30_____ 41+_____

---

1. Are you currently enrolled in courses leading to a degree or certificate in science, mathematics, or technology? Yes____ No____

2. Names of institution currently attending:
_____

3. While attending SCC, were you given special help with the courses you had in science, mathematics or technology? Yes____ No____

4. From what source did you receive this special help?
_____

5. Was the extra help adequate to meet your needs in courses in science, mathematics, or technology? Yes____ No____

6. Were you aware of the existence of Project 30, a program designed to assist minority students in mathematics, science, or technology? Yes____ No____

7. Do you wish to pursue a career in an area related to science, mathematics, or technology? Yes____ No____

8. What specific profession or career are you currently pursuing?
_____

9. Did you seek or receive encouragement from instructors or counselors relative to pursuing course work in science, mathematics, and technology? Yes____ No____

10. Please make any additional comments that might prove helpful to us as we attempt to improve the opportunities for minority students desiring to pursue careers in science, mathematics, and technology. Thank you!

_____

_____

_____

_____

_____

_____

_____

ELK:eb (1/22/75)

All records, documents, and questionnaires related to this report are on file and available for review by qualified persons upon request at the Office of Research and Development, Sacramento City College, 3835 Freeport Boulevard, Sacramento, California 95822.

UNIVERSITY OF CALIF.
LOS ANGELES

FEB 6 1976

CLEARINGHOUSE FOR
JUNIOR COLLEGES